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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/362,698	07/29/1999	TAKASHI KATO	684.2621CIP	7175

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EXAMINER
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AMARI, ALESSANDRO V

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 12/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/362,698

Applicant(s)

KATO ET AL.

Examiner

Alessandro V. Amari

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2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 28,29,33,34 and 38-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28,29,33,34 and 38-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 28, 29, 33, 34, 38, 39, 40 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuji et al. U.S. Patent 5,424,552.

In regard to claim 28, Tsuji et al. discloses (see Figure 1) an optical system for forming an image of an object, said optical system comprising: an optical element (R), which is deformed by the weight thereof as described in column 27, lines 44-68, and at least one optical member (40, 41, 43, 45) for preventing a change in optical performance of said optical system due to deformation of said optical element as described in column 27, lines 44-68, when said optical element is provided in said optical system as shown in Figure 1.

In regard to claim 33, Tsuji et al. discloses (see Figure 1) a projection exposure apparatus comprising: an illumination optical system (6) for illuminating a pattern formed on a mask; and a projection optical system for projecting the pattern of the mask onto a wafer, said projection optical system including (i) an optical element being deformed by the weight thereof (R) as described in column 27, lines 44-68, and (ii) at least one optical member (40, 41, 43, 45) for preventing a change in optical performance of said optical system due to deformation of said optical element, when said optical element is provided in said optical system as described in column 27, lines 44-68 and as shown in Figure 1.

Regarding claim 34, Tsuji et al. discloses a device manufacturing method including a process for transferring, through projection exposure, a pattern of a mask onto a wafer by use of a projection exposure apparatus as described in column 5, lines 65-68, column 6, lines 32 and as shown in Figure 1.

Regarding claims 38 and 40, Tsuji et al. discloses that said optical element is a diffractive optical element (R). Inherently, the reticle R has diffractive optical properties and is therefore a diffractive optical element.

Regarding claims 29, 39 and 41, Tsuji et al. discloses that said at least one optical member has at least one aspherical surface as shown in Figure 1.

3. Claims 28, 29, 33, 34 and 38-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Ushida et al. U.S. Patent 5,754,340.

In regard to claims 28 and 42, Ushida et al. discloses (see Figure 4) an optical system for forming an image of an object, comprising: an optical element (111), said

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optical element being deformed by the weight thereof and having a refractive power as shown in Figures 5 and 6; and at least one optical member (131) for preventing a change in optical performance of said optical system due to deformation of said optical element, when said optical element is provided in said optical system as described in column 10, lines 53-67, column 11, lines 1-67 and column 12, lines 1-4. Although the prior art does not specifically disclose the optical element being deformed by the weight thereof, this feature is seen to be an inherent teaching of that device since any optical element will be deformed by the weight thereof and given that the optical element is part of an optical system the other optical members must compensate for any aberrations (including those due to weight deformation) in order for the system to function as intended.

In regard to claims 33 and 49, Ushida et al. discloses (see Figure 7) a projection exposure apparatus comprising: an illumination optical system (10) for illuminating a pattern formed on a mask; and a projection optical system (16) for projecting the pattern of the mask onto a wafer, said projection optical system and optical system as recited in claim 42 including (i) an optical element (22) being deformed by the weight thereof, and (ii) at least one optical member (26) for preventing a change in optical performance of said optical system due to deformation of said optical element, when said optical element is provided in said optical system as shown in Figure 7. Although the prior art does not specifically disclose the optical element being deformed by the weight thereof, this feature is seen to be an inherent teaching of that device since any optical element will be deformed by the weight thereof and given that the optical element is part of an

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optical system the other optical members must compensate for any aberrations (including those due to weight deformation) in order for the system or apparatus to function as intended.

Regarding claims 29, 39, 41 and 45, Ushida et al. discloses that said at least one optical member has at least one aspherical surface as shown in Figure 4.

Regarding claims 38, 40 and 47, Ushida et al. discloses that said optical element is a diffractive optical element as described in column 10, lines 56-59.

Regarding claims 34 and 50, Ushida et al. discloses (see Figure 7) a device manufacturing method including a process for transferring, through projection exposure, a pattern of a mask onto a wafer by use of a projection exposure apparatus as recited in claims 33 and 49 as described in column 15, lines 20-46.

Regarding claim 43, Ushida et al. discloses that the refractive power is a positive refractive power as shown in Figures 5 and 6.

Regarding claim 44, Ushida et al. discloses that the refractive power is a negative refractive power as shown in Figures 5 and 6.

Regarding claim 46, Ushida et al. discloses a second optical element (121) juxtaposed to said optical element, wherein said at least one aspherical surface is provided on said second optical element as shown in Figure 4.

Regarding claim 48, Ushida et al. discloses that said optical element has a step-like shape as described in column 3, lines 62-66.

***Response to Arguments***

4. Applicant's arguments filed 08 August 2002 have been fully considered but they are not persuasive.

The applicant argues that Tsuji et al. does not teach or suggest that any lens incorporated into a projection lens is deformed by the weight thereof and furthermore there is no teaching of any optical element for preventing a change in optical performance of an optical system due to deformation of an optical element when the optical element is provided in the optical system.

In response to this argument, the applicant is reminded that the rejection is based upon the claim recitation. Claim 28, line 3 and claim 42, line 2 recite "an optical element". The element R in figure 1 of Tsuji is a reticle which is definitely an optical element and there is a teaching of the optical element being deformed by the weight thereof and for a optical element for preventing a change in optical performance of an optical system as described in column 27, lines 44-68 of Tsuji et al.

The applicant further argues that the reticle R is deformed in the Tsuji et al. and not an optical element having a refractive power.

In response to this argument, the applicant should note the 102 rejection based on Ushida et al.


5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava *ava*  
November 25, 2002

  
MARK A. ROBINSON  
PRIMARY EXAMINER